

AD-A032 469

EAGLE-PICHER INDUSTRIES INC JOPLIN MO COUPLES DEPT  
MANUFACTURING METHODS AND TECHNOLOGY MEASURE FOR PLASTIC HOUSIN--ETC(U)  
SEP 76 D V GORDON DAAB05-73-C-2081

F/G 17/2.1

UNCLASSIFIED

NL

1 OF 1  
ADA  
032 469



END  
DATE  
FILMED  
11-3-77  
NTIS

U.S. DEPARTMENT OF COMMERCE  
National Technical Information Service

AD-A032 469

MANUFACTURING METHODS AND TECHNOLOGY MEASURE FOR  
PLASTIC HOUSINGS FOR C-2328-B-GRA-39 AND  
C-2329-B-GRA-39 RADIO

EAGLE-PICHER INDUSTRIES, INCORPORATED  
JOPLIN, MISSOURI

20 SEPTEMBER 1976

AD A032469

335100

ELEVENTH QUARTERLY PROGRESS REPORT

1 February 1976 to 30 April 1976

Manufacturing Methods and Technology Measure

For Plastic Housings for

C-2328-B-GRA-39 and C-2329-B-GRA-39 Radio

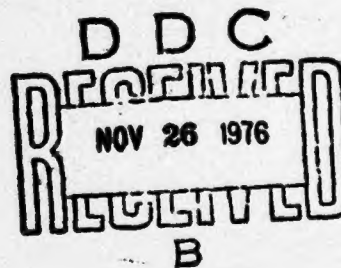
AMC Contract # DAAB05-73-C-2081

Placed By

U. S. Army Electronics Command  
Production Division, Procurement and Production Directorate  
DRSEL-PP-I-PI-1  
Ft. Monmouth, New Jersey 07703

Prepared By

Eagle-Picher Industries, Inc.  
Electronics Division  
Couples Department  
Joplin, Missouri  
64801



Dale V. Gordon - Project Engineer 417-623-8000

Robert D. Brown - Contract Administrator 417-623-8000

Distribution of this document approved  
for public release. Distribution unlimited.

Commander  
U. S. Army Electronics Command  
Attention: DRSEL-PP-I-PI-1  
Ft. Monmouth, New Jersey 07703

REPRODUCED BY  
NATIONAL TECHNICAL  
INFORMATION SERVICE  
U. S. DEPARTMENT OF COMMERCE  
SPRINGFIELD, VA. 22161

NOTICE

The findings in this report are not to be construed as an official Department of the Army position unless so designated by other authorized documents.

-----

The citation of trade names and names of manufacturers in this report is not to be construed as an official government indorsement or approval of commercial products or services referenced herein.

-----

Destroy this report when it is no longer needed. Do not return it to the originator.

-----

This project has been accomplished as part of the U. S. Army Advance Production Engineering Program, which has as its objective the timely establishment of manufacturing processes, techniques or equipment to insure the efficient production of current or future defense programs.

-----



UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

| REPORT DOCUMENTATION PAGE  |                       | READ INSTRUCTIONS<br>BEFORE COMPLETING FORM  |
|--|-----------------------|--|
| 1. REPORT NUMBER<br>Eleventh Quarterly Progress<br>Report No. 11   | 2. GOVT ACCESSION NO. | 3. RECIPIENT'S CATALOG NUMBER  |
| 4. TITLE (and Subtitle)<br>Eleventh Quarterly Progress Report,<br>Manufacturing Methods and Technology Measure<br>for Plastic Housings for C-2328-B-GRA-39 and<br>C-2329-B-GRA-39 Radio                                      |                       | 5. TYPE OF REPORT & PERIOD COVERED<br>Eleventh Quarterly Report<br>1 Feb. 1976 to 30 Apr. 1976 |
| 7. AUTHOR(s)<br><br>Dale V. Gordon   |                       | 6. PERFORMING ORG. REPORT NUMBER   |
| 8. PERFORMING ORGANIZATION NAME AND ADDRESS<br>Eagle-Picher Industries, Inc.<br>Electronics Division, Couples Department<br>Joplin, Missouri 64801   |                       | 9. CONTRACT OR GRANT NUMBER(s)<br>DAAB05-73-C-2081   |
| 11. CONTROLLING OFFICE NAME AND ADDRESS<br>Department of the Army<br>U. S. Army Electronics Command<br>Fort Monmouth, New Jersey 03703   |                       | 10. PROGRAM ELEMENT, PROJECT, TASK<br>AREA & WORK UNIT NUMBERS<br><br>2739615                  |
| 14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)<br>Chief, DCASO Kansas City<br>Room 201, Noland Plaza Office Bldg.<br>3675 South Noland Road<br>Independence, Missouri 64055                     |                       | 12. REPORT DATE<br>20 September 1976   |
|  |                       | 13. NUMBER OF PAGES<br>14  |
|  |                       | 15. SECURITY CLASS. (of this report)<br>UNCLASSIFIED   |
|  |                       | 16a. DECLASSIFICATION/DOWNGRADING<br>SCHEDULE<br>N/A   |
| 18. DISTRIBUTION STATEMENT (of this Report)<br><br>Distribution Unlimited  |                       |  |
| 17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)<br><br>N/A  |                       |  |
| 19. SUPPLEMENTARY NOTES<br><br>N/A   |                       |  |
| 19. KEY WORDS (Continue on reverse side if necessary and identify by block number)   |                       |  |
| 20. ABSTRACT (Continue on reverse side if necessary and identify by block number)<br>1. A meeting was held at USABCOM regarding the radio housings.<br>2. New design for attaching hardware.<br>3. Retest of First Articles. |                       |  |

**MANUFACTURING METHODS AND TECHNOLOGY MEASURE  
FOR PLASTIC HOUSINGS FOR C-2328-B-GRA-39 and C-2329-B-GRA-39**

**RADIO**

**ELEVENTH QUARTERLY PROGRESS REPORT**

**1 February 1976 to 30 April 1976**

**Object of study; Establish a pilot production  
capability for producing plastic cases  
for Army Radio Sets - AN-GRA-39B**

**AMC Contract # DAAB05-73-C-2081**

**Placed By**

**U. S. Army Electronics Command  
Production Division, Procurement and Production Directorate  
DRSEL-PP-I-PI-1  
Ft. Monmouth, New Jersey 07703**

**Prepared By**

**Dale V. Gordon for  
Eagle-Picher Industries, Inc.  
Electronics Division  
Couples Department  
Joplin, Missouri  
64801**

**Distribution of this document approved  
for public release. Distribution unlimited.**

**Commander  
U. S. Army Electronics Command  
Attention: DRSEL-PP-I-PI-1  
Ft. Monmouth, New Jersey 07703**

|                                 |   |
|---------------------------------|---|
| ACCESSION for                   |   |
| RTIS                            | White Section <input checked="" type="checkbox"/> |
| DDC                             | Bull Section <input type="checkbox"/>             |
| UNANNOUNCED                     | <input type="checkbox"/>                          |
| JUSTIFICATION.....              |   |
| BY.....                         |   |
| DISTRIBUTION/AVAILABILITY CODES |   |
| Dist.                           | AVAIL. and/or SECTION                             |
| A                               |   |

ABSTRACT

1. A meeting was held at USAECOM regarding the radio housings.
2. New design for attaching hardware.
3. Retest of First Articles.

TABLE OF CONTENTS

| <u>SECTION</u> | <u>DESCRIPTION</u>                    | <u>PAGE NO.</u> |
|----------------|---------------------------------------|-----------------|
| I              | PURPOSE                               | 1               |
| II             | REPORTS AND CONFERENCES               | 3               |
| III            | FACTUAL DATA                          | 5               |
|                | A. First Article Testing              | 5               |
|                | B. Test Results                       | 5               |
|                | C. Test Conclusions                   | 5               |
|                | D. Disposition of Retest Samples      | 5               |
| IV             | CONCLUSIONS                           | 7               |
| Figure 1       | GRA/39 Radio Housings Clamping Detail | 6               |



## I. PURPOSE

The primary objective of this project is to perform the production engineering required to permit the replacement of aluminum housings with molded plastic housings for the AN/GRA-39B Radio Telephone.

Major accomplishments which will result from the project are as follows:

1. To provide the engineering effort required to establish a capability for pilot line production of the following AN/GRA-39B Radio Housing parts.
  - A. Panel (SM-D-450185)
  - B. Panel (SM-D-450179)
  - C. Case (SM-D-450170)
  - D. Cover (SM-D-456214)
2. Determination, design and fabrication of special tooling, special test equipment, and prototype machines for the pilot line.
3. To prepare and revise as necessary a Management Evaluation Program.
4. Application of Quality Control Procedures including Quality Control Checks of pertinent points of manufacture.
5. To design, fabricate and test engineering samples for design approval.
6. To fabricate and test First Article Samples using pilot line equipment and tooling referred to in 2 above.
7. To perform a Pilot Production Run of 24 parts each to demonstrate the capability of producing 20 radio housings per 8 hour day.

8. To prepare test reports for engineering samples, First Article samples and Pilot Production units including reworked and rejected items.
9. To submit Monthly Letter Reports, Formal Quarterly Reports and a Final Report covering the entire period of the project. Also a step by step procedure of manufacturing instructions, specifications, information, and other data will be provided.
10. To prepare a General Report on Step II in accordance with paragraph 3.5.3 of Electronics Command Industrial Preparedness Procurement Requirements No. 15, Revised 3 August 1971.

## II. REPORTS AND CONFERENCES

A meeting was held on February 11, 1976, at USAECOM to discuss the First Article Test Samples. The following is a summary of that meeting.

### Attendees

#### USAECOM

Major H. Layton

Dick Lane

Fred Hochberg

Sarah Rosen

John Arpin

Herbert Steiner

Len Bush

Don Bowers

#### EAGLE-PICHER

Dale Gordon - Engineering

Joe Leonard - Contracts

The following conclusions and agreements were made during the meeting.

1. The failure modes listed by ECOM were:
  - a) Separation of the strikes from the panel assemblies.
  - b) Distortion of the styrene battery box. (This problem was due to an over-heat condition and would not occur at specification levels.
2. Eagle-Picher will submit a plan of corrective action, correct the problem and retest.
3. An estimated time for completion of item 2 of 15 weeks was given.
4. ECOM has agreed to delete further EMI and Fungus Testing.

5. Eagle-Picher will submit a revised delivery schedule for remaining line item submissions.

### Reports

Progress Report Numbers 28, 29 and 30 were submitted during the period.

The problem involving the separation of the strikes from the radio panel assembly was generally the main concern and item of discussion during this meeting. Corrective action ideas and procedures were discussed and recommendations were made.

The corrective action approach decided upon was to eliminate the strikes on the panel assembly and instead, machine or mold a slight indentation in the top of each panel which would be used as a clamping point with a slight redesign in the latch. This design offers the following advantages:

1. Minimal cost to incorporate.
2. Sound in regard to dynamic testing.
3. Reduces the number of parts.
4. Reduces assembly operations and therefore would be less costly to produce.



### III. FACTUAL DATA

#### A. First Article Testing

The design change which was agreed to during the meeting mentioned above was incorporated and a retest of the first article was conducted. This test involved only the high temperature high humidity drop of SCS-458. See Figure 1 for the details describing the design change. The change involved only the method of securing the panel assembly to the case assembly.

#### B. Test Results

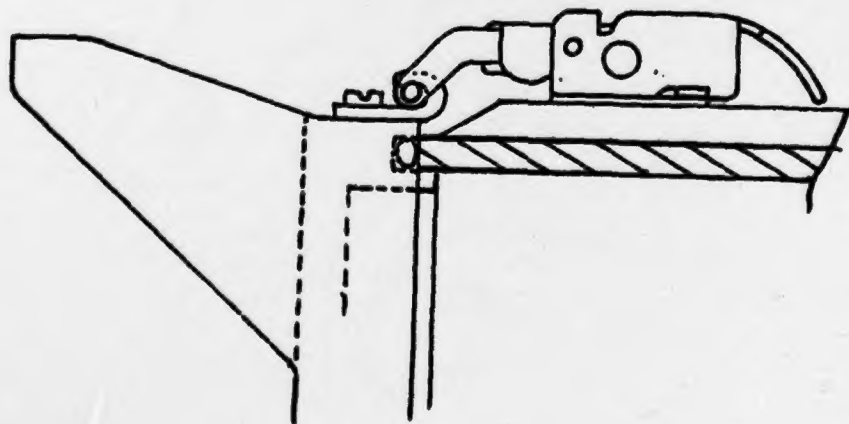
The test samples passed the high temperature-high humidity drop test of SCS-458. Only minor scuffing and scrapping of the plastic housings was the only damage incurred.

#### C. Test Conclusions

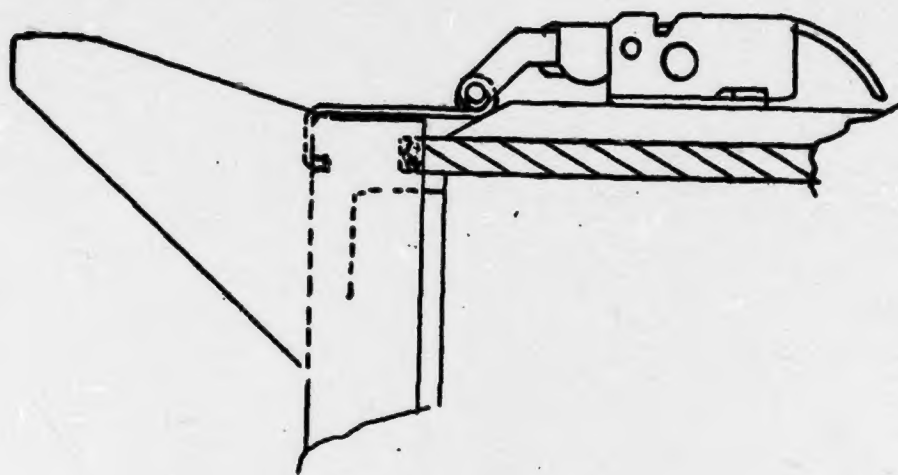
It can be concluded that the new method of securing the panel and cover to the case is far superior to the original method used. No problems are expected during subsequent acceptance testing.

#### D. Disposition of Retest Samples

The samples were sent to USAECOM on April 6, 1976 for their evaluation.



OLD METHOD



NEW METHOD

GRA/39 RADIO HOUSINGS  
CLAMPING DETAIL

FIGURE 1

#### IV. CONCLUSIONS

It can be concluded from the above that the GRA/39 Radio Housings will meet the specifications set forth in SCS-458 after the modification described above is incorporated. The modification represents an improvement in regard to resistance to dynamic environments as well as to its producibility.